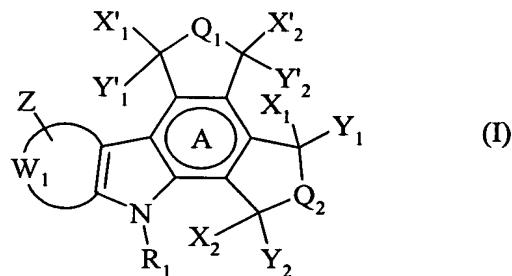




CLAIMS

Claims 1 – 20 (canceled)

21-(previously presented) A compound selected from those of formula (I) :



wherein :

- 5     • A represents a saturated or partially or fully unsaturated ring, wherein the unsaturation optionally confers an aromatic nature on the ring,
- 10    • W<sub>1</sub>, together with the carbon atoms to which it is bonded, represents phenyl or pyridyl,
- 15    • Z represents one or more identical or different groups of formula U–V wherein :
  - ✓ U represents a single bond, linear or branched (C<sub>1</sub>–C<sub>6</sub>)alkylene, linear or branched (C<sub>2</sub>–C<sub>6</sub>)alkenyl optionally substituted by one or more identical or different groups selected from halogen and hydroxy, and/or optionally containing one or more unsaturated bonds,
  - ✓ V represents a group selected from hydrogen, halogen, cyano, nitro, azido, linear or branched (C<sub>1</sub>–C<sub>6</sub>)alkyl, aryl, aryl-(C<sub>1</sub>–C<sub>6</sub>)alkyl in which the alkyl moiety may be linear or branched, hydroxy, linear or branched (C<sub>1</sub>–C<sub>6</sub>)alkoxy, aryloxy, aryl-(C<sub>1</sub>–C<sub>6</sub>)alkoxy in which the alkoxy moiety may be linear or branched, formyl, carboxy, aminocarbonyl, NR<sub>3</sub>R<sub>4</sub>, -C(O)–T<sub>1</sub>, -C(O)–NR<sub>3</sub>–T<sub>1</sub>, -NR<sub>3</sub>–C(O)–T<sub>1</sub>, -O–C(O)–T<sub>1</sub>, -C(O)–O–T<sub>1</sub>, -NR<sub>3</sub>–T<sub>2</sub>–NR<sub>3</sub>R<sub>4</sub>, -NR<sub>3</sub>–T<sub>2</sub>–OR<sub>3</sub>, -NR<sub>3</sub>–T<sub>2</sub>–CO<sub>2</sub>R<sub>3</sub>, -O–T'2–NR<sub>3</sub>R<sub>4</sub>, -O–T'2–OR<sub>3</sub>, -O–T'2–CO<sub>2</sub>R<sub>3</sub>, and -S(O)<sub>r</sub>–R<sub>3</sub>,
- 20    wherein :
  - ⇒ R<sub>3</sub> and R<sub>4</sub>, which may be identical or different, each represents a group selected

from hydrogen, linear or branched ( $C_1$ - $C_6$ )alkyl, aryl, and aryl-( $C_1$ - $C_6$ )alkyl in which the alkyl moiety may be linear or branched, or

$R_3$  and  $R_4$ , together with the nitrogen atom carrying them, form a saturated monocyclic or bicyclic heterocycle that has from 5 to 10 ring atoms, and which optionally contains in the ring system a second hetero atom selected from oxygen and nitrogen, and which is optionally substituted by a group selected from linear or branched ( $C_1$ - $C_6$ )alkyl, aryl, aryl- $(C_1$ - $C_6$ )alkyl in which the alkyl moiety may be linear or branched, hydroxy, linear or branched ( $C_1$ - $C_6$ )alkoxy, amino, linear or branched mono- $(C_1$ - $C_6$ )alkylamino, and di( $C_1$ - $C_6$ )alkylamino in which the alkyl moieties may be linear or branched,

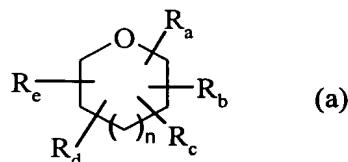
- ⇒  $T_1$  represents a group selected from linear or branched ( $C_1$ - $C_6$ )alkyl which may be optionally substituted by a group selected from  $-OR_3$ ,  $-NR_3R_4$ ,  $-CO_2R_3$ ,  $-C(O)R_3$  and  $-C(O)NR_3R_4$  wherein  $R_3$  and  $R_4$  are as defined hereinbefore; aryl, and aryl- ( $C_1$ - $C_6$ )alkyl in which the alkyl moiety may be linear or branched; or  $T_1$  represents linear or branched ( $C_2$ - $C_6$ )alkenyl optionally substituted by a group selected from  $-OR_3$ ,  $-NR_3R_4$ ,  $-CO_2R_3$ ,  $-C(O)R_3$  and  $-C(O)NR_3R_4$  wherein  $R_3$  and  $R_4$  are as defined hereinbefore,
- ⇒  $T_2$  represents linear or branched ( $C_1$ - $C_6$ )alkylene,
- ⇒  $T'_2$  represents a linear or branched ( $C_1$ - $C_6$ )alkylene optionally substituted with one or more hydroxy groups,
- ⇒  $t$  represents integer of from 0 to 2 inclusive,
- or  $Z$  represents methylenedioxy or ethylenedioxy,

- **Q<sub>1</sub>** represents a group selected from oxygen, NR<sub>2</sub>, wherein R<sub>2</sub> represents a group selected from hydrogen, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl, aryl, aryl-(C<sub>1</sub>-C<sub>6</sub>)alkyl in which the alkyl moiety may be linear or branched, cycloalkyl, cycloalkyl-(C<sub>1</sub>-C<sub>6</sub>)alkyl in which the alkyl moiety may be linear or branched, -OR<sub>3</sub>, -NR<sub>3</sub>R<sub>4</sub>, -O-T<sub>2</sub>-NR<sub>3</sub>R<sub>4</sub>, -NR<sub>3</sub>-T<sub>2</sub>-NR<sub>3</sub>R<sub>4</sub>, linear or branched (C<sub>1</sub>-C<sub>6</sub>)hydroxyalkylamino, di((C<sub>1</sub>-C<sub>6</sub>)hydroxyalkyl)amino, in which the alkyl moieties may be linear or branched, -C(O)-R<sub>3</sub> and -NH-C(O)-R<sub>3</sub>; or R<sub>2</sub> represents linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkylene substituted by one or more identical or different groups selected from halogen, cyano, nitro, -OR<sub>3</sub>, -NR<sub>3</sub>R<sub>4</sub>, -CO<sub>2</sub>R<sub>3</sub>, -C(O)R<sub>3</sub>, linear or branched (C<sub>1</sub>-C<sub>6</sub>)-hydroxyalkylamino, di((C<sub>1</sub>-C<sub>6</sub>)hydroxyalkyl)amino, in which the alkyl moieties may be

linear or branched, and  $-\text{C}(\text{O})-\text{NHR}_3$ ,  $\text{R}_3$ ,  $\text{R}_4$  and  $\text{T}_2$  being as defined hereinbefore,

- $\text{Q}_2$  represents a group selected from oxygen,  $\text{NR}'_2$ , wherein  $\text{R}'_2$  represents a group selected from hydrogen, linear or branched ( $\text{C}_1\text{-C}_6$ )alkyl, aryl, aryl- $(\text{C}_1\text{-C}_6)$ alkyl, in which the alkyl moiety may be linear or branched, cycloalkyl, cycloalkyl- $(\text{C}_1\text{-C}_6)$ alkyl, in which the alkyl moiety may be linear or branched,  $-\text{OR}_3$ ,  $-\text{NR}_3\text{R}_4$ ,  $-\text{O}-\text{T}_2-\text{NR}_3\text{R}_4$ ,  $-\text{NR}_3-\text{T}_2-\text{NR}_3\text{R}_4$ , linear or branched ( $\text{C}_1\text{-C}_6$ )hydroxyalkylamino, di(( $\text{C}_1\text{-C}_6$ )hydroxyalkyl)amino, in which the alkyl moieties may be linear or branched,  $-\text{C}(\text{O})-\text{R}_3$  and  $-\text{NH}-\text{C}(\text{O})-\text{R}_3$ ; or  $\text{R}'_2$  represents a linear or branched ( $\text{C}_1\text{-C}_6$ )alkylene substituted by one or more identical or different groups selected from halogen, cyano, nitro,  $-\text{OR}_3$ ,  $-\text{NR}_3\text{R}_4$ ,  $-\text{CO}_2\text{R}_3$ ,  $-\text{C}(\text{O})\text{R}_3$ , linear or branched ( $\text{C}_1\text{-C}_6$ )hydroxyalkylamino, di(( $\text{C}_1\text{-C}_6$ )hydroxyalkyl)amino, in which the alkyl moieties may be linear or branched, and  $-\text{C}(\text{O})-\text{NHR}_3$ ,  $\text{R}_3$ ,  $\text{R}_4$  and  $\text{T}_2$  being as defined hereinbefore,
- $\text{X}_1$  represents a group selected from hydrogen, hydroxy, linear or branched ( $\text{C}_1\text{-C}_6$ )alkoxy, mercapto, and linear or branched ( $\text{C}_1\text{-C}_6$ )alkylthio,
- $\text{Y}_1$  represents hydrogen, or
- $\text{X}_1$  and  $\text{Y}_1$ , with carbon carrying them, together form carbonyl or thiocarbonyl,
- $\text{X}_2$  represents a group selected from hydrogen, hydroxy, linear or branched ( $\text{C}_1\text{-C}_6$ )alkoxy, mercapto and linear or branched ( $\text{C}_1\text{-C}_6$ )alkylthio,
- $\text{Y}_2$  represents hydrogen, or
- $\text{X}_2$  and  $\text{Y}_2$ , with carbon carrying them, together form carbonyl or thiocarbonyl,
- $\text{X}'_1$  represents a group selected from hydrogen, hydroxy, linear or branched ( $\text{C}_1\text{-C}_6$ )alkoxy, mercapto and linear or branched ( $\text{C}_1\text{-C}_6$ )alkylthio,
- $\text{Y}'_1$  represents hydrogen, or
- $\text{X}'_1$  and  $\text{Y}'_1$ , with carbon carrying them, together form carbonyl or thiocarbonyl,
- $\text{X}'_2$  represents a group selected from hydrogen, hydroxy, linear or branched ( $\text{C}_1\text{-C}_6$ )alkoxy, mercapto and linear or branched ( $\text{C}_1\text{-C}_6$ )alkylthio,
- $\text{Y}'_2$  represents hydrogen, or

- $X'_2$  and  $Y'_2$ , with carbon carrying them, together form carbonyl or thiocarbonyl,
- $R_1$  represents a group selected from hydrogen, linear or branched ( $C_1-C_6$ )alkyl which may be optionally substituted by one or more groups selected from hydroxy, linear or branched ( $C_1-C_6$ )alkoxy, linear or branched ( $C_1-C_6$ )hydroxyalkoxy or  $NR_3R_4$ , the groups  $R_3$  and  $R_4$  being as defined hereinbefore ; or  $R_1$  represents a group of formula (a) :



wherein :

- ✓  $R_a$ ,  $R_b$ ,  $R_c$  and  $R_d$ , which may be identical or different, each represents, independently of the others, a bond or a group selected from hydrogen, halogen, hydroxy, linear or branched ( $C_1-C_6$ )alkoxy, aryloxy, aryl- $(C_1-C_6)$ alkoxy in which the alkoxy moiety may be linear or branched, linear or branched ( $C_1-C_6$ )alkyl, aryl- $(C_1-C_6)$ alkyl in which the alkyl moiety may be linear or branched, aryl,  $-NR_3R_4$  wherein  $R_3$  and  $R_4$  are as defined hereinbefore, azido,  $-N=NR_3$  (wherein  $R_3$  is as defined hereinbefore),  $-O-C(O)-R_5$  wherein  $R_5$  represents linear or branched ( $C_1-C_6$ )alkyl (optionally substituted by one or more groups selected from halogen, hydroxy, amino, linear or branched ( $C_1-C_6$ )alkylamino, and di( $C_1-C_6$ )alkylamino in which the alkyl moieties may be linear or branched); or  $R_5$  represents aryl, aryl- $(C_1-C_6)$ alkyl in which the alkyl moiety may be linear or branched, cycloalkyl or heterocycloalkyl,
- ✓  $R_e$  represents methylene ( $H_2C=$ ) or a group of formula  $-U_1-R_a$  wherein  $U_1$  represents single bond, methylene and  $R_a$  is as defined hereinbefore,
- ✓  $n$  is 0 or 1,

it being understood that the group of formula (a) is bonded to the nitrogen atom by  $R_a$ ,  $R_b$ ,  $R_c$ ,  $R_d$  or  $R_e$ ,

its enantiomers, diastereoisomers, and addition salts thereof with a pharmaceutically acceptable acid or base,

with the proviso that the compound may not be :

- 3b,6a,6b,7-tetrahydro-1*H*-dipyrrolo[3,4-a:3,4-c]carbazole-1,3,4,6-(2*H*,3a*H*,5*H*)-tetrone ;
- 5-ethyl-3b,6a,6b,7-tetrahydro-1*H*-dipyrrolo[3,4-a:3,4-c]carbazole-1,3,4,6-(2*H*,3a*H*,5*H*)-tetrone ;
- 3b,6a,7,11*c*-tetrahydro-1*H*-dipyrrolo[3,4-a:3,4-c]carbazole-1,3,4,6-(2*H*,3a*H*,5*H*)-tetrone ;
- 3b,6a,6b,7-tetrahydrofuro[3,4-a]pyrrolo[3,4-c]carbazole-1,3,4,6-(2*H*,3a*H*,5*H*)-tetrone ;

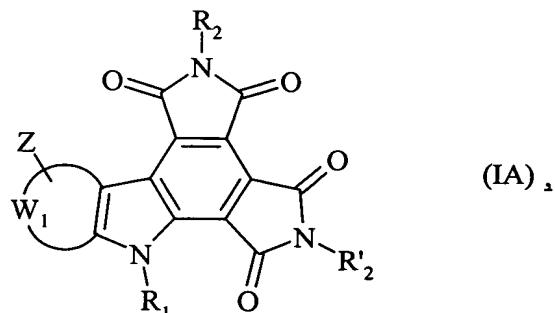
wherein aryl is understood to mean a phenyl, naphthyl, dihydronaphthyl, tetrahydronaphthyl, indenyl or indanyl group, each of those groups optionally being substituted by one or more identical or different groups selected from halogen, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl, linear or branched (C<sub>1</sub>-C<sub>6</sub>)trihaloalkyl, hydroxy, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkoxy, and NR<sub>3</sub>R<sub>4</sub>, R<sub>3</sub> and R<sub>4</sub> being as defined hereinbefore.

**22-** (previously presented) A compound of claim 21, wherein X<sub>1</sub> and Y<sub>1</sub>, with the carbon carrying them, together form carbonyl, X<sub>2</sub> and Y<sub>2</sub>, with the carbon carrying them, together form carbonyl, X'<sub>1</sub> and Y'<sub>1</sub>, with the carbon carrying them, together form carbonyl and X'<sub>2</sub> and Y'<sub>2</sub>, with the carbon carrying them, together form carbonyl.

**23-** (previously presented) A compound of claim 21 wherein Q<sub>1</sub> represents -NR<sub>2</sub>.

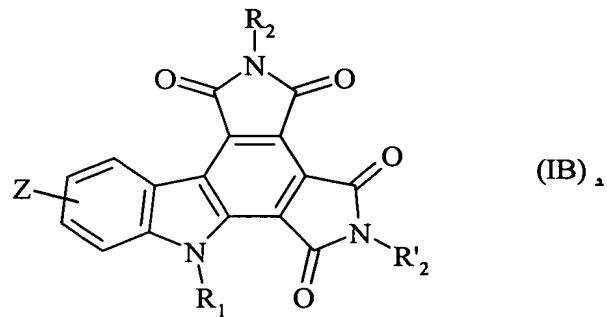
**24-** (previously presented) A compound of claim 21 wherein Q<sub>2</sub> represents -NR'<sub>2</sub>.

**25-** (currently amended) A compound of claim 21 which is a compound of formula (IA) :



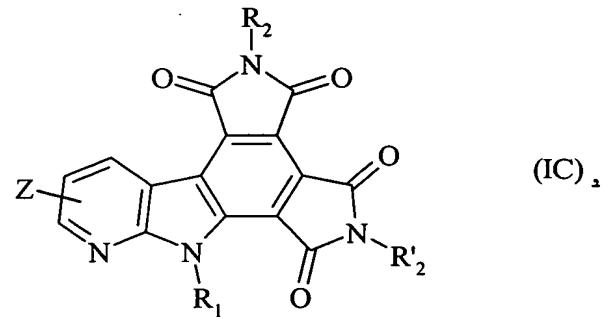
wherein R<sub>1</sub>, R<sub>2</sub>, R'<sub>2</sub>, W<sub>1</sub>, and Z are as defined in claim 21.

26- (currently amended) A compound of claim 21 which is a compound of formula (IB) :



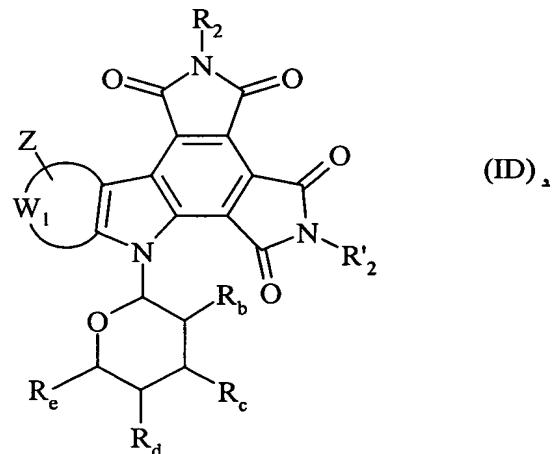
wherein R<sub>1</sub>, R<sub>2</sub>, R'<sub>2</sub>, and Z are as defined in claim 21.

5 27- (currently amended) A compound of claim 21 which is a compound of formula (IC) :



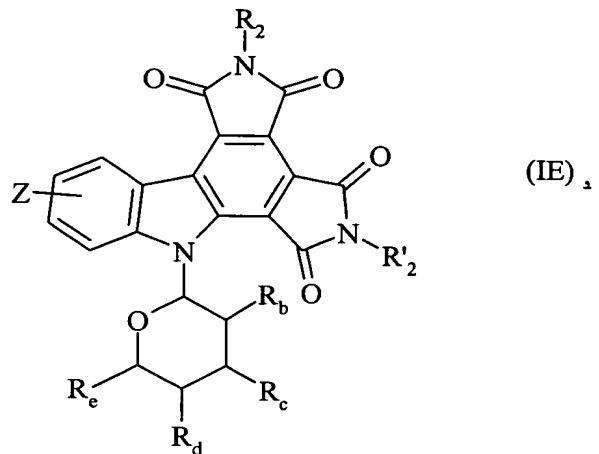
wherein R<sub>1</sub>, R<sub>2</sub>, R'<sub>2</sub>, and Z are as defined in claim 21.

28- (currently amended) A compound of claim 21 which is a compound of formula (ID) :



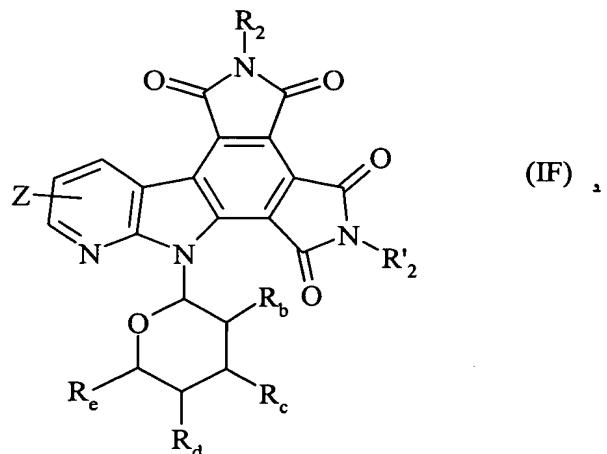
wherein  $R_2$ ,  $R'_2$ ,  $W_1$ ,  $Z$ ,  $R_b$ ,  $R_c$ ,  $R_d$ , and  $R_e$  are as defined in claim 21.

**29-** (currently amended) A compound of claim 21 which is a compound of formula (IE) :



5 wherein R<sub>2</sub>, R'<sub>2</sub>, Z, R<sub>b</sub>, R<sub>c</sub>, R<sub>d</sub>, and R<sub>e</sub> are as defined in claim 21.

**30-** (currently amended) A compound of claim 21 which is a compound of formula (IF) . . .



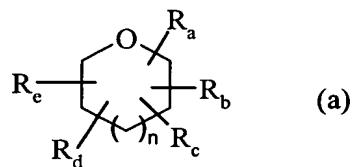
wherein  $R_2$ ,  $R'_2$ ,  $Z$ ,  $R_b$ ,  $R_c$ ,  $R_d$ , and  $R_e$  are as defined in claim 21.

31- (previously presented) A compound of claim 21 wherein Z represents a group of formula U-V wherein U represents single bond and V represents a group selected from hydrogen, halogen, nitro, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl, hydroxy, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkoxy, aryl-(C<sub>1</sub>-C<sub>6</sub>)alkoxy in which the alkoxy moiety may be linear or branched,

NR<sub>3</sub>R<sub>4</sub>, wherein R<sub>3</sub> and R<sub>4</sub> each represents a hydrogen atom.

32- (previously presented) A compound of claim 21 wherein Z represents a group of formula U-V wherein U represents single bond and V represents a group selected from hydrogen, halogen, hydroxy, aryl-(C<sub>1</sub>-C<sub>6</sub>)alkoxy in which the alkoxy moiety may be linear or branched.

33- (previously presented) A compound of claim 21 wherein R<sub>1</sub> represents hydrogen, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl or a group of formula (a) :



bonded to the nitrogen atom by R<sub>a</sub>,

wherein :

- R<sub>b</sub>, R<sub>c</sub>, and R<sub>d</sub> represent hydroxy, aryl-(C<sub>1</sub>-C<sub>6</sub>)alkoxy in which the alkoxy moiety may be linear or branched, -O-C(O)-R<sub>5</sub> wherein R<sub>5</sub> represents linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl,
- R<sub>e</sub> represents a group of formula U<sub>1</sub>-R<sub>a</sub> wherein U<sub>1</sub> represents methylene and R<sub>a</sub> has the same definitions as R<sub>b</sub>, R<sub>c</sub> and R<sub>d</sub> and n is 0,

34- (previously presented) A compound of claim 21 wherein R<sub>1</sub> represents hydrogen.

35- (previously presented) A compound of claim 21 wherein R<sub>2</sub> represents hydrogen, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl, OR<sub>3</sub>, NR<sub>3</sub>R<sub>4</sub>, or linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkylene substituted by OR<sub>3</sub>, NR<sub>3</sub>R<sub>4</sub> wherein R<sub>3</sub> and R<sub>4</sub> are as defined for formula (I).

36- (previously presented) A compound of claim 21 wherein R<sub>2</sub> represents hydrogen, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkylene substituted by NR<sub>3</sub>R<sub>4</sub> wherein R<sub>3</sub> and R<sub>4</sub> are as defined for formula I.

37- (previously presented) A compound of claim 21 wherein R<sub>2</sub>' represents hydrogen, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkyl, linear or branched (C<sub>1</sub>-C<sub>6</sub>)alkylene substituted by NR<sub>3</sub>R<sub>4</sub> wherein R<sub>3</sub> and R<sub>4</sub> are as defined for formula (I).

38- (previously presented) A compound of claim 21 which is selected from :

- 5     • 1*H*-dipyrrolo[3,4-a:3,4-c]carbazole-1,3,4,6(2*H*,5*H*,7*H*)-tetrone,
- 2-methyl-1*H*-dipyrrolo[3,4-a:3,4-c]carbazole-1,3,4,6(2*H*,5*H*,7*H*)-tetrone,
- 2,5-dimethyl-1*H*-dipyrrolo[3,4-a:3,4-c]carbazole-1,3,4,6(2*H*,5*H*,7*H*)-tetrone,
- 2-[2-(diethylamino)ethyl]-5-methyl-1*H*-dipyrrolo[3,4-a:3,4-c]carbazole-  
      1,3,4,6(2*H*,5*H*,7*H*)-tetrone, and
- 10    • 10-hydroxy-1*H*-dipyrrolo[3,4-a:3,4-c]carbazole-1,3,4,6(2*H*,5*H*,7*H*)-tetrone.

39- (previously presented) A method for treating a living animal body afflicted with cancer comprising the step of administering to the living animal body an amount of a compound of claim 21, which is effective for alleviation of cancer

40- (currently amended) A pharmaceutical composition ~~useful in treating cancer~~ comprising as active principle an effective amount of a compound of claim 21, together with one or more pharmaceutically acceptable excipients or vehicles.